

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A magnetic resonance imaging system comprising:

MT-pulse applying means for applying to an object an MT (magnetization transfer) pulse formed as an ~~RERF~~ (radio frequency) pulse of ~~(i) a an off-resonance frequency which is off-resonance at~~ a region to be imaged, ~~of~~(ii) duration less than 10 ms, and ~~of~~(iii) a waveform based on either a Sinc function or a Gaussian function;

gradient applying means for applying, concurrently with application of the MT pulse, a gradient pulse to select an applied position of the MT pulse to the object so that the applied position of the MT pulse is different from the region to be imaged;

spoiler applying means for applying a gradient spoiler pulse to the object after applying both the MMT pulse and the gradient pulse to the region to be imaged; and

scanning means for performing a scan to acquire an echo signal from the region to be imaged after applying the gradient spoiler pulse.

2. Cancelled.

3. (Previously Presented) The magnetic resonance imaging system according to claim 20, wherein the duration of the MT pulse is 6 ms or less.
- 4-5. Cancelled.
6. (Previously Presented) The magnetic resonance imaging system according to claim 20, wherein the scan is a two-dimensional scan performed based on a multi-slice imaging technique.
7. (Previously Presented) The magnetic resonance imaging system according to claim 20, wherein the scan is a three-dimensional scan performed based on a multi-slice imaging technique.
8. Cancelled.
9. (Previously Presented) The magnetic resonance imaging system according to claim 1 wherein the duration of the MT pulse is set to a period of time during which relaxation of a spin-lattice magnetization of magnetic spins in the object is substantially not completed.
10. Cancelled.
11. (Currently Amended) The magnetic resonance imaging system according to claim 9, wherein the scan is a two-dimensional scan performed based on a multi-slice imaging technique.

12. (Previously Presented) The magnetic resonance imaging system according to claim 9, wherein the scan is a three-dimensional scan performed based on a multi-slice imaging technique.

13. Cancelled.

14. (Currently Amended) A magnetic resonance imaging method for acquiring an echo signal on the basis of magnetic resonance phenomena of at least two types of nuclear pools in an object, the two types of nuclear pools being mutually coupled through a coupling relationship based on at least one of ~~a~~chemical exchange phenomenon and a cross relaxation phenomenon, the method comprising ~~the steps of:~~

decoupling the coupling relationship between the at least two types of nuclear pools by applying to the object an MT (magnetization transfer) pulse formed as an RF (radio frequency) pulse of ~~an off-resonance~~(i) a frequency to which is off-resonance at a region to be imaged, ~~of~~(ii) duration less than 10 μ secs, and ~~of~~(iii) a waveform based on either a Sinc function or a Gaussian function;

applying a gradient spoiler pulse to the decoupled nuclear pools
concurrently with application of MT pulse, a gradient pulse so as to select an applied
position of the MT pulse which is different from the region to be imaged; and

acquiring the echo signal from athe region to be imaged of the object after applying
the gradient spoiler.

15. (Original) The magnetic resonance imaging method according to claim 14, wherein the two types of nuclear pools consist of a nuclear pool of free water and a nuclear pool of a macromolecule.

16. (Previously Presented) The magnetic resonance imaging method according to claim 15, wherein the echo signal from the region to be imaged is acquired by a two-dimensional scan performed based on a multi-slice imaging technique.

17. (Previously Presented) The magnetic resonance imaging method according to claim 15, wherein the echo signal from the region to be imaged is acquired by a three-dimensional scan performed based on a multi-slice imaging technique.

18. Cancelled.

19. Cancelled.

20. (Currently Amended) A magnetic resonance imaging system comprising:

an MT-pulse applying unit configured to apply to an object an MT (magnetization transfer) pulse formed as an RF (radio frequency) pulse of ~~an off-resonance~~(i) a frequency ~~to~~which is off-resonance at a region to be imaged ~~of~~, (ii) a duration less than 10 ~~ms~~ms, and ~~of~~(iii) a waveform based on either a Sinc function or a Gaussian function;

a region selecting unit configured to apply, concurrently with application of the MT pulse, a gradient pulse to select an applied position of the MT pulse that is different from the region to be imaged;

a spoiler applying unit configured to apply a gradient spoiler pulse to the object after applying the MT pulse to the region to be imaged; and

a scanning unit configured to perform a scan to acquire an echo signal from the region to be imaged after applying the gradient spoiler pulse to the object.

21. (New) The magnetic resonance imaging system according to claim 20, wherein the duration of the MT pulse is set to a period of time during which relaxation of a spin-lattice magnetization of magnetic spins in the object is substantially not completed.